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September 2010

TO: **TELECOMMUNICATIONS MANAGERS**

The California Statewide Interoperability Executive Committee (CalSIEC) and California Interoperability Communications Office (CICO) are pleased to provide you with the updated California Fire Service and Rescue Emergency Mutual Aid System (FIRE Net) Plan. Important updates have been made to the plan. The plan now reflects the CalSIEC's role in providing oversight of the system and includes a streamlined application process.

An important issue over the next two years is that of Narrowbanding. The Federal Communications Commission (FCC) has mandated that all non-Federal public safety licensees operating 25 kHz radio systems in the 150-174 MHz and 421-512 MHz bands (the VHF and UHF bands) migrate to more efficient 12.5 kHz (narrowband) channels by January 1, 2013. In other words, the FCC will no longer allow the use of wideband on VHF and UHF public safety frequencies, including the FIRE Net channels, from December 31, 2012 on and will not automatically issue new licenses.

Cal EMA will release further information on the transition of interoperability channels from wideband operations to narrowband operations, including effective dates and policy changes, in the near future.

Your input is very important to us. Please email all feedback, comments, and questions on the updated FIRE Net Plan to Interop@calema.ca.gov.

NOTE: The CalSIEC and CICO strongly encourage all entities licensed to use FIRE Net to apply for a modification to their existing FCC license(s) as soon as possible. This is crucial to comply with the new narrowband licensing requirements and to ensure interoperability with agencies that have already transitioned to narrowband.

John Penido
CalSIEC Chair

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California Fire Service and Rescue Emergency Mutual Aid System (FIRE Net)

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Introduction

The Cal EMA Fire and Rescue Division Radio Communications System, known as FIRE Net, was formerly known as OES FIRE. FIRE Net is designed and equipped to provide effective emergency communications in support of fire and rescue mutual aid operations and assumes a number of responsibilities. Consistent with the intent and provisions of the State Fire Service and Rescue Emergency Mutual Aid Plan, Cal EMA assumes responsibility for providing a communications network connecting all 6 mutual aid regions, the 58 operational areas, other appropriate state agencies and Cal EMA centralized communications facilities. In addition, Cal EMA provides radio communications capability in its fleet of emergency apparatus and specialized mobile communications equipment to facilitate on-scene coordination of multi-agency resources at major emergencies.

Network Design

The Fire Net is designed and equipped to provide two-way communications both on Cal EMA-controlled and “local” controlled frequencies. For purpose of simplification they are described as “basic system” and “support system.”

Basic System

This in-place system employs the use of two VHF highband channels operating through a network of mountain top repeaters interconnected by the state microwave circuit. Repeater and microwave interconnect switches are tone controlled. Single tone generators are required to activate the repeaters and are an integral component of all Cal EMA fire radio transmitters. In addition, selected base control stations are equipped with touch-tone pads to interconnect the radio to the microwave system via the repeaters to permit communications with Cal EMA headquarters or other base stations located throughout the state (see Figure 1).

Fire Net has 23 interconnected mountaintop sites and operates on the frequency pairings indicated below.

California Fire Service and Rescue Emergency Mutual Aid System (FIRE Net)					
Licensee:	State of California				
Service:	Fire				
Identifier	Freq	Base, Mobile, or Fixed	Max Power	CTCSS	Priority Authorized
Cal EMA 1	154.1600 (Rx) 154.1600 (Tx)	Base and Mobile	110 W Out	MPL	1, 2
Cal EMA 1 A	154.160 (Rx) 159.135 (Tx)	Base, Mobile, and Fixed	110 W Out	MPL	1, 2

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Cal EMA 1B	154.160 (Rx) 159.195 (Tx)	Base, Mobile, and Fixed	110 W Out	MPL	1, 2
Cal EMA 2	154.2200 (Rx) 154.2200 (Tx)	Base and Mobile	110 W Out	MPL	1, 2
Cal EMA 2A	154.220 (Rx) 159.135 (Tx)	Base, Mobile, and Fixed	110 W Out	MPL	1, 2
Cal EMA 2B	154.220 (Rx) 159.195 (Tx)	Base, Mobile, and Fixed	110 W Out	MPL	1, 2
Description of Use	Cal EMA FIRE Net is designed and equipped to provide effective emergency communications in support of fire and rescue mutual aid operations and is consistent with the intent and provisions of the State Fire and Rescue Emergency Plan.				

Support System

In addition to the “Basic System,” Cal EMA provides a variety of mobile communications equipment for use in the coordination of multi-agency resources at major emergencies. This equipment includes:

- Mobile multi-frequency communications units;
- Mobile repeaters (Fire Net, White Fire, FIREMARS); and
- Handheld (walky-talky) caches.

System Management

Within Cal EMA, the responsibility for managing Fire Net is met by two divisions, the Fire and Rescue Division and the Telecommunications Branch. The Cal EMA Fire and Rescue Division establishes and enforces procedures for participation in, and use of, the system. Cal EMA Fire Coordinators ensure that the system’s frequencies are used properly and in a coordinated manner. The Cal EMA Telecommunications Branch is responsible for technical standards and procedures. The Telecommunications Branch Coordinators assist and advise on technical matters, as requested. In addition, the California Statewide Interoperability Executive Committee (CalSIEC) oversees FIRE Net and advises Cal EMA on the development, supervision and control of the system.

Fire and Rescue executives are responsible for ensuring that applications, licensing and operations on FireMARS comply with the regulations and policies set forth in this document within their agency.

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Operational Standards

Channel Usage Procedures

The use of all FIRE Net channels require prior authorization from the Fire and Rescue Branch and Telecommunications Branch and must be done through proper frequency coordination. To request authorization contact Cal EMA Fire Duty Officer at (916-845-8911 or warning_center@oes.ca.gov).

Channel Identifiers

Only the Standard California Channel Identifiers are used for FIRE Net.¹ It is strictly prohibited to assign a local identifier to a FIRE Net channel.

Conceptual Use/Dispatch Procedures

All Cal EMA Fire and Rescue communications equipment is designed and purchased to support the Statewide Fire and Rescue Mutual Aid System. Thus, all mobile (transportable) equipment is available to any fire agency (department) upon request.

Requests for FIRE Net communications equipment must be processed through the established system, the same as engines, rescue, etc.

“Local” to “Area” to “Region” to “State”

Inventory lists of FIRE Net equipment are maintained at all Operational Area, Region and state dispatch centers. Cal EMA field and headquarters staff are available to present orientation and specialized training programs covering all aspects of the program from “request procedures” to “operator training.”

Permitted Uses

FIRE Net communications network and equipment is provided for use by the fire service and for official mutual-aid communications use only. Participation in FIRE Net is open to all California fire mutual aid coordinators at the State, regional, and Operational Area levels.

Cal EMA Fire and Rescue Division is licensed by the Federal Communications Commission to operate on all fire frequencies in California during an emergency. All communications on the FIRE Net frequencies must be in accordance with Part 90, Subpart B of FCC Regulations (Public Safety Radio Pool). FIRE Net participants transmit communications essential to official activities during an emergency. Unofficial communications on FIRE Net are prohibited.

Prohibited Uses

FIRE Net shall only be used when authorized during a mutual aid emergency.

¹ After the FIRE Net channels are narrowbanded, they will be referred to by their NPSTC/ANSI channel identifiers.

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IdentificationMobile Units

1. Mobile units identify the unit or station they wish to contact and identify themselves by using their agency-assigned unit designator. These are not shortened and include the entire set of letters and/or numbers. For example: "6 Paul 21, this is 6 Paul 20."
2. During interagency operations, mobile units identify their agency in addition to their agency-assigned unit designator. For example: "Cal EMA Fire 58-501C, this is Sacramento 6 Paul 20."

Base Stations

Base stations identify themselves by using their agency name along with any other usual identifier. Base stations must use the FCC call sign shown on their FIRE Net license at least once every 30 minutes or at the end of a contact. For example: "California KVZ29."

Channel Use Priorities

Fire Net use is governed by a system of priorities that must be respected at all times

- **Priority 1:** Disaster and extreme emergency operations for mutual aid and interagency communications
- **Priority 2:** Emergency or urgent operations involving imminent danger to the safety of life or property

Message Precedence

Message Precedence is a classification system that establishes the priority of message content while a channel is in use – i.e., it helps determine which message has precedence over another on a channel. It is used for both verbal and written message traffic. The order of precedence of messages is:

1. **New Incident:** Messages pertaining to a new incident. Once the new incident is addressed, it no longer has precedence unless it has a higher priority.
2. **Emergency:** Messages involving the imminent safety of life or protection of property, including messages to request supplies, materials or instructions vital to relief of emergency operations.
3. **Priority:** Messages that are official and time-bound, but are not covered in the emergency category. Priority messages may include notice of deaths or injury in a disaster area.
4. **Welfare:** Messages involving the health and welfare of an individual in a disaster area.
5. **Routine:** Messages pertaining to routine operations.

Plain Language

All communications on FIRE Net are in plain language. Radio codes, acronyms, and abbreviations are to be avoided as they may cause confusion between agencies and disciplines and jeopardize officer safety.

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Voice Privacy

The use of FIRE NET channels for transmission of encoded, encrypted, digital, or scrambled message is prohibited. However, under special circumstances, a one-time waiver may be granted to allow for encryption. All inquiries and requests for waivers should be addressed to the Cal EMA Fire Duty Officer at (916-845-8911 or warning_center@oes.ca.gov)

Supervisory Responsibility

Each agency manager and supervisor bears the responsibility for the compliance of operations on FIRE Net to the FIRE Net Plan. Violations are reported to Cal EMA who will contact the violating agency's executives to assist in correcting problems or deficiencies. See Appendix A for the complaint procedure.

Technical Standards and Procedures***Voice Privacy***

Speech scrambling, digital voice privacy [DVP], digital encryption [DES], inversion, and other forms of scrambling are not permitted on any FIRE Net channel.

Paging or Signaling

Tone or digital signaling, paging and/or alerting is not permitted on any FIRE Net channel. However, it is permitted to sound simple alert tones [attention beeps] prior to broadcasts. Automatic station identification is also permitted.

Data Transmission

Transmission of data is not permitted on FIRE Net channels.

Interoperability Operation

In the event of a public safety Priority 1 or 2 emergency, and in keeping with appropriate FCC Rules, a FIRE Net channel may be *temporarily* cross-banded through automatic or manual equipment with another channel. A cross-band or use of a gateway switch must be discontinued when the operation requiring its use is finished. Refer to Cal EMA's Statewide Gateway Units Standard Operating Procedure for more information on gateway procedures.

FCC Call Sign Announcements

All stations must identify in accordance with FCC Rules and Regulations, Part 90.425. Each station or system must be identified by transmission of its FCC call sign:

- During each transmission, or exchange of transmissions, or
- Once each 30 minutes during periods of continuous operation

The call sign is the FCC-assigned set of letters and numbers found on the license authorization. Mobiles and Portables must identify with their agency assigned unit or officer number. Violations may result in revocation of the operating authority for the offending agency.

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Essential Interoperability Guidelines Checklist

- ✓ **OBEY PRIORITIES:** When a higher priority use is required, all lower priority traffic yields the frequency immediately.
- ✓ **USE PLAIN LANGUAGE AT ALL TIMES.**
- ✓ **IDENTIFY WITH FULL AGENCY UNIT DESIGNATOR AND FCC CALL-SIGNS (BASE STATIONS AND MOBILES).**
- ✓ **MONITOR THE CHANNEL PRIOR TO TRANSMITTING.**
- ✓ **USE APPROPRIATE CODED SQUELCH:** Do not use local tones on interoperability channels without the capability of monitoring the mutual aid tone (156.7/\$293) and turning the tone protection off.
- ✓ **USE THE CHANNEL'S STANDARD ID:** Program the standard California channel ID into your radio's display.
- ✓ **DO NOT SCRAMBLE OR ENCRYPT MESSAGES.**
- ✓ **DO NOT PERMANENTLY OR SEMI-PERMANENTLY LINK MUTUAL AID CHANNELS TO EACH OTHER OR TO LOCAL AGENCY CHANNELS.**

Respect the policies and procedures set forth in each interoperability system's plan to ensure the interoperability channels are available for use in emergency situations.

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Appendix A: Complaint Procedure

Report all operations on mutual aid channels that are detrimental to officer safety or to the management of an incident, which fail to follow the procedures outlined in this mutual aid plan, which cause interference to other users, or that violate FCC Regulations 90.20 and 90.405.

To report flagrant violations that endanger officer of peace safety, immediately contact the LDO via the California State Warning Center (CSWC) (Telephone: 916-845-8911).

To report interference issues from outside sources and other misuses of mutual aid channels:

1. Attempt to identify the offending station.
2. Contact the chief executive of that department.
3. If the problem persists, contact the Cal EMA LDO via the CSWC (916-845-8911 or warning_center@oes.ca.gov) and relay:
 - The date and time of the problem
 - The circumstances regarding the interference or misuse
 - Information detailing how the misuse interfered with operations or safety
 - Information (identification, call signs, etc.) that would help locate the offending agency.
4. Keep audio logging tapes, tape cassettes, or digital files recording the misuse to send to Cal EMA. [If requested, Cal EMA will return the tape after its investigation.] On receipt of a complaint, Cal EMA will conduct an investigation.

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Appendix B: Acronym List

AES: Advanced Encryption Standard

ANSI: American National Standards Institute

CALCORD: California On-Scene Emergency Coordination System

Cal EMA: California Emergency Management Agency

CalSIEC: California Statewide Interoperability Executive Committee

CICO: California Interoperability Coordinator's Office

CSWC: California State Warning Center

CTCSS: Continuous Tone-Coded Squelch System

DCS: Digital Coded Squelch

DES: Data Encryption Standard

DVP: Digital voice privacy

FCC: Federal Communications Commission

NAC: Network Access Code

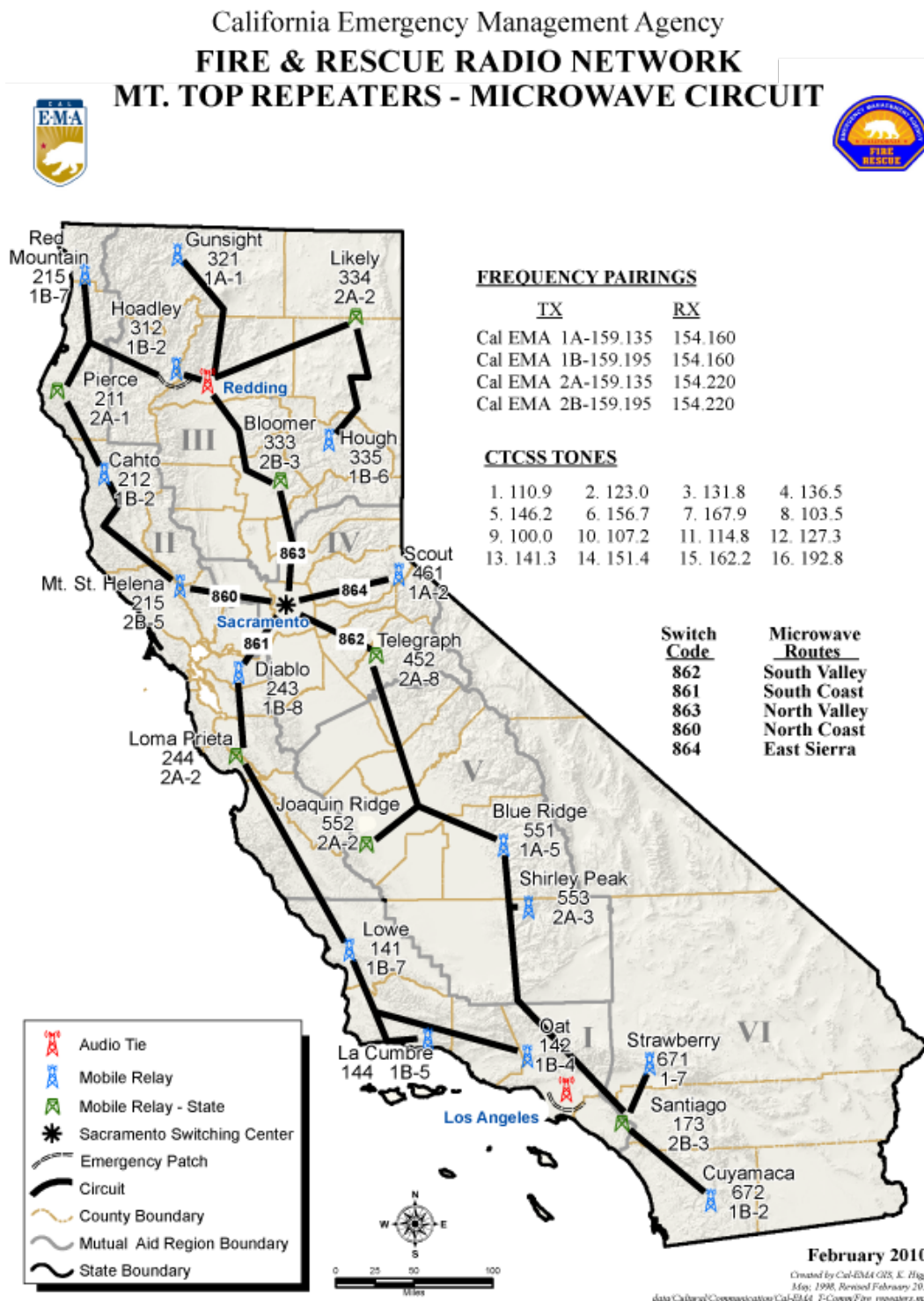
NPSTC: National Public Safety Telecommunications Council

PSCD: Public Safety Communications Division

TDO: Telecommunications Duty Officer

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Appendix C: FIRE Net Mountain Top Repeaters-Microwave Map



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Appendix D: Cal EMA Fire Network Dialing Guide

Mobile Relay	County	Channel	Tone	Access	Shut-off
<i>North Coast</i>	<i>Route-860</i>				
Mt. St. Helena	Sonoma	2B	5	215	8888
Cahto Peak	Mendocino	1B	2	212	8888
Mount Pierce	Humboldt	2A	1	211	8888
Red Mountain	Del Norte	1B	7	216	8888
<i>North Valley</i>	<i>Route-863</i>				
Bloomer	Butte	2B	3	333	*88
Hoadley	Trinity	1B	2	312	*88
Gunsite	Siskiyou	1A	1	321	8888
Likely Mountain	Lassen	2A	2	334	8888
Mount Hough	Plumas	1B	6	335	8888
<i>South Coast</i>	<i>Route-861</i>				
Mount Diablo	Contra Costa	1B	8	243	*88
Loma Prieta	Santa Cruz	2A	3	244	*88
Mount Lowe	San Luis Obispo	1B	7	141	*88
La Cumbre Peak	Santa Barbara	1B	5	144	8888
Oat Mountain	Los Angeles	1B	4	142	*88
<i>South Valley</i>	<i>Route-862</i>				
Telegraph Peak	Tuolumne	2A	8	452	*88
Joaquin Ridge	Fresno	2A	2	552	8888
Blueridge	Tulare	1A	5	551	8888
Shirley Peak	Kern	2A	3	553	8888
Santiago Peak	Riverside	2B	3	173	8888
Strawberry Peak	San Bernardino	1B	7	671	8888
Cuyamaca Peak	San Diego	1B	2	672	*88
<i>East Sierra</i>	<i>Route-864</i>				
Scout Peak	El Dorado	1A	2	461	*88

Notes:

1. FIRE NET CURRENTLY USES "*" INSTEAD OF "9" FOR SWITCHBOARD ACCESS
2. If "8888" does not shut off a hill, try "*88."
3. If the hill you are accessing the network through uses "*88" for shut off, dial "8888*88" to shut off the distant "8888" hill, NOT "*8888."
4. If the hill you are accessing the network through uses "8888" for shut off, dial "*8888" to shut off a distant "*88" hill.
5. "Drive out: timers are set for approximately 4 minutes.